Novel High Temperature Strain Gauge, Phase I

Completed Technology Project (2009 - 2009)

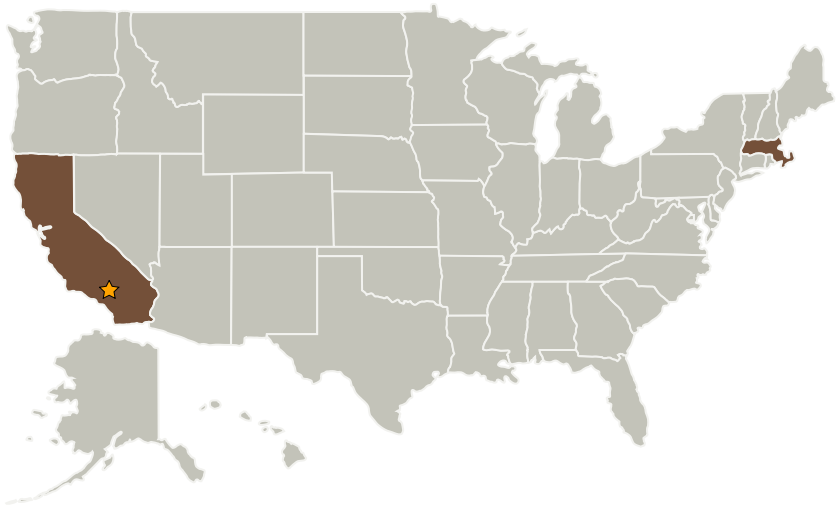
Project Introduction

Advanced high-temperature sensor technology and bonding methods are of great interests in designing and developing advanced future aircraft. Current state-of-the-art high temperature strain sensors are made of wires or thin film deposited by PVD on shims and then welded or glued onto strainable member, which is suffering the disadvantages such as creep, relaxation hysteresis and a limited range of operational temperatures. In this proposal, Boston Applied Technologies Incorporated (BATi) proposes to develop a novel high temperature strain gauge system through direct deposition technique. The strain gauge material features lower temperature coefficient, high structural stability and resistance to oxidation at high temperature. A temperature compensation circuit is employed in this design to minimize the effect of temperature change. Moreover, the insulating coating and protective coating are deposited by the same direct deposition technique to secure the accurate strain measurements on various hot structures, and making the whole system in a high efficient and low cost manner.

Anticipated Benefits

Successful development of high temperature strain gauge has wide application in both commercial and military industries. The high temperature strain gauge can be used to monitor the leading edges of hypersonic vehicles or gas turbine blades working under high temperature (up to1000 oC), thus provide important information for system design and safety evaluation.

Primary U.S. Work Locations and Key Partners



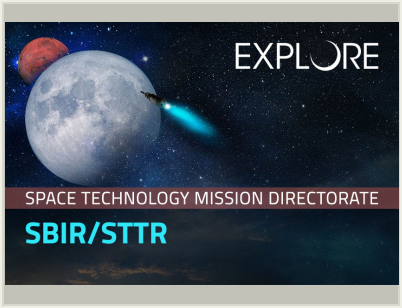


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Table of Contents

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Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California
Boston Applied Technologies, Inc.	Supporting Organization	Industry Minority-Owned Business	Woburn, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Armstrong Flight Research Center (AFRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Anthony Piazza

Principal Investigator:

Kewen Li

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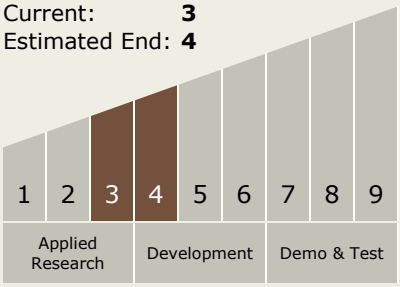
Technology Maturity (TRL)

Start: **3**
Current: **3**
Estimated End: **4**



Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.6 Instrumentation and Health Monitoring for EDL